UNITED STATES VIRGIN ISLANDS DEPARTMENT OF AGRICULTURE

USDA AMS Specialty Crop Block Grant Farm Bill 2009

Final Performance Report

Agreement Number: 12-25-B-0952

Increasing the Supply and Demand of Orchard Fruits and Leafy Greens through Production Demonstration Models and a *Virgin Fresh*™ Marketing Campaign

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Project Title: Increasing the Supply and Demand of Orchard Fruits and Leafy Greens through Production Demonstration Models

Project Summary

The U.S.V.I specialty crop industry has many unique opportunities and challenges. The opportunities are present in a population of farmers that are dedicated to the prosperity and growth of the agriculture industry and the general public who vibrantly support the revival of the local agriculture industry. The challenges faced by many local farmers relate to limited local agriculture research information and the high up - front cost of diversifying their crops. The establishment of production demonstration plots (production models) will address these challenges by demonstrating cost-effective setups and best production practices for interested farmers, students and the general public. The establishment of these models encourages farmers to produce the specialty crops which will eventually increase the supply of the crops in the local market. Increased supply in conjunction with a Virgin Fresh specialty crop marketing campaign will stimulate demand and increase the competitiveness of the specialty crop industry in the U.S.V.I. The demonstration models would be set up on each island and represent the islands respective challenges. This project is extremely important and timely due to the growing interest of locals, restaurants and tourist in buying local products. This project was not built on a previously funded project.

Project Partners

The V.I. Department of Agriculture (VIDA) is in partnership with the University of the Virgin Islands Cooperative Extension Service (UVI CES), Agricultural Experiment Station (UVI AES) and the Department of Tourism in this project.

Project Approach

VIDA awarded sub-grants to approved applicants with plans and proven ability to set up demonstration models. The selected specialty crop categories to be modeled included: orchard plants and leafy greens. The models would be used to educate farmers and others, about the best management practices for producing, harvesting and selling these types of crops on their respective islands.

Sub-Grantee Selection and Related Activities

- A request for proposals (RFP) was issued to identify potential individual farmer and institutional sub-grantees for participation in the VIDA FY 2009 SCBG-FB project. From this RFP, seventeen sub-grantee applications were received with the following distribution: 9 from St. Croix, 6 from St. Thomas, and 2 from St. John.

- The VIDA reviewed all sub-grantee applications and the strongest applicants' proposals were selected for further review based on the following general parameters: the applicants experience with farming, ability to follow through with the project's reporting requirements, the suitability of their planting site, and access to water for irrigation.

- Selected applicants were then required to submit a detailed list of plant material, irrigation equipment, and other necessary items (fertilizer, composter, etc) needed to establish a demonstration model of an orchard or leafy green production site with a $3000 sub-grant budget limit for individuals, a $5000 limit for small institutions and larger individual sites, and no specified limit for research institutions. In addition to this list, a planting/irrigation layout of their site and a proposed management plan were also required.

- Each plan was reviewed by the VIDA and a final list of individual farmer and institutional sub-grantees was selected (Table 1). A Memorandum of Understanding (MOU) was signed by both the VIDA and the sub-grantee outlining the responsibilities of each party over the two year maximum timeframe of the project.

- The individual farmer sub-grantees received an award of materials totaling up to their respective limits. To accomplish this, the VIDA tallied all of the planting materials, irrigation, and supplies needed to complete the each project and purchased these items in bulk to take advantage of the cost savings associated with bulk purchases and shipping. In the interest of time some sub grantees were issued there funds and made purchases on their own. The supplies that were purchased in bulk arrived and have been distributed to sub-grantees.

- In order to ensure no organization, institution and/or individual would solely benefit from the sub-grant funding, VIDA stipulated that each sub-grantee use funds to create model plots that would be accessible to the public for tours, workshops and other educational experiences. In addition, the produce and slips would be donated to participants of the workshops etc. In additions those products that were sold to the public the sub grantee's agreed to use those funds to reinvest into the model programs.

- For each institution the VIDA issued the sub-grantee award as a disbursement from the VIDA federal grants account at the V.I. Department of Finance to the institutions' accounting division. This disbursement method will allow each institution to progress with their project's implementation without financial delays.

The VIDA assisted the sub-grantees with the establishment of their demonstration model by offering recommendations on the following topics:

- Planting, spacing and production recommendations specific to each crop selected to be planted.
- Water tank and irrigation setup advice. Irrigation system maintenance advice.
- Disease control recommendations.
- Rototiller training for farmers interested in using the rototillers purchased for the USVI SCBG-FB 2009.
- Guidelines for how to properly submit reports to the VIDA for use in reporting to USDA.

Table 1: Summary of sub-grantee awards issued.

Location	Sub-Grantee Name, Project Type, Specialty Crop	Acreage	Award
St. Croix Sub-Grantees	University of the V.I. Agricultural Experiment Station (UVI AES) (*Institution*): Sorrel Research	1	$30,000.00
	Kirk Beniot (*Individual*): Orchard Establishment – Mangos	2	$3,000.00
	Oswald Jackson (*Individual*): Fruit Plot Establishment - Pineapples	1	$3,000.00
	Yvette Brown (*Individual*): Fruit Plot Establishment - Pineapples	1	$3,000.00

St. Thomas Sub-Grantees	Myron Henneman (*Individual*): Orchard Establishment – Mango, Guava, Guavaberry	1	$2,000.00
	Charles Berry(individual): - Fruit Orchard - Guava	1	$3,000.00
	June Archibald (*Individual*): Specialty Greens – Asian Greens	0.5	$2,000.00
	Jacob Spell(business) – Fruit Plot Establishment -Pineapples	5.5	$5,000.00
	Nevon DeCastro Fruit Plot Establishment - Pineapple		$5,000.00
St. John Sub-Grantees	Thalia Reyes (*Individual*): Orchard Establishment – Fruit Orchards and Leafy Greens	3	$5,000.00
Total Sub-Grantee Issuances	**10 Sub-Grantee Projects**		**$61,000.00**

Institutional Sub-Grantees

Project Title: *Year-Round Sorrel Production for Enhanced Marketability*.
Institution Name: University of the Virgin Islands Agricultural Experiment Station (UVI AES)
Principal Investigators: Thomas W. Zimmerman, Ph.D., Stafford A. Crossman, M.S.

Activities Performed

Field trials were conducted during 2009-2010 at three farmer field locations (Vertrum Bradley, Reinaldo Vasquez, and V.I. Farmers' Cooperative), the VIDA, and one greenhouse trial at UVI. Both the V.I. Co-op and Reinaldo had two plantings of sorrel at different dates. Each plot was planted with transplants started in the UVI greenhouse and transported to site. Sorrel seeds were obtained from the USDA Germplasm repository, local U.S.V.I. farmers, St Kitts, and Trinidad (Table 2).

Table 2: Source of sorrel seeds and the variety names used in the research.

Sorrel Seed Source	Sorrel Variety 1	Sorrel Var. 2	Sorrel Var. 3	Sorrel Var. 4	Sorrel Var. 5	Sorrel Var .6	Sorrel Var. 7	Sorrel Var. 7	Sorrel Var. 8
USDA	268097	268100	468409	496717	496938	500721	500726	500748	500752
U.S.V.I.	BRD	DB	JMS	VDN	DW	VIC	DR		
St. Kitts	SKR	SKD	KDN						
Trinidad	TTR								

The planting dates and locations were as follows:

1. 8/28/09 Bradley (20 varieties)
2. 9/1/09 Reinaldo (20 varieties)
3. 9/3/09 VIDA (17 varieties)
4. 10/14/09 VI Coop (17 varieties)
5. 12/18/09 VI Coop (16 varieties)
6. 2/12/10 UVI (6 varieties)
7. 5/13/10 Reinaldo (16 varieties)

Research Results

Initial results indicate that at least three photoperiodic sorrel types can be identified:

1. **Short-day photoperiod:** flowers in November, this included all USVI varieties and four from the USDA (268097, 268100, 468409, 500748)
2. **Early-bearing:** initiate flowers early, fruit harvestable by late October.
3. **Day-neutral:** initiate flowers year round, fruit 8-10 weeks from seed (KDN, SKD).

All plantings except the May set, resulted in fruit production. The late planting in May was decimated by a wilt disease that the abundant rains may have promoted. A truly day-neutral line could therefore not be identified for production during the long days of summer.

Branch angles varied between sorrel lines from 90^{o} to less than 45^{o}. The shorter branch angles are a better characteristic because it keeps branches upright and fruit off the ground making it easier to harvest. One line, USDA 268097, exhibited a compact dwarf plant that may have potential to be grown in pots on balconies and patios.

The sorrel fruit calyx has two characteristics: enclosed and open. The open form is easier to peel and to observe maturity of the seed capsule. Seed capsules of the open form also dry more quickly with less fungal growth. The open calyx, a new characteristic not seen before in the VI, was only found in SKD. Two varieties had a spiny calyx which was minimal and it appears these lines (USDA 468409, USDA 500748) are grown for the leaves which can be used in salads or stewed. Line USDA 268100 had long fruit nearly twice the length of other calyxes.

Problems and Delays: None

Project Title: *Establishing a Model Community Garden in Savanne: Specialty Greens*
Institution Name: Economic Development Authority, Enterprise Zone Commission (EDA EZC)
Project Coordinator: Nadine Marchena Kean, Director of Enterprise Zone.

Activities Performed:
The Savanne Community Garden project sought to establish a model urban garden producing lettuce, lemongrass, basil, pepper, and passion fruit. The lettuce, lemongrass, basil, and peppers will be the key crops in the Garden, while the passion fruit vine and trellis system will serve as a live barrier to deter trespassers from entering the garden. The products will be marketed to community members and restaurants using a student-designed logo and the VIDA's Virgin Fresh Specialty Crop logo.

Problems and Delays:

This project was unable to get off of the ground in a timely manner, due to permitting and other issues with the land clearing. The applicant was withdrawn from the project in order to give another entity or individual the opportunity to utilize the funds. It is the intention of EDA EZC to apply to another grant opportunity to fulfill the project at a later time.

Individual Farmer Sub-Grantees

Project Title: *Expanding Locally Grown Pineapple Production.*
Individual Name: Oswald Jackson

The purpose of this project is to introduce a larger quantity of fresh locally grown pineapples to the community, whereby giving them the opportunity to compare the locally grown to the imported. The project will increase the community's knowledge and awareness of the benefit of eating locally grown products in comparison to those imported, which have lost most of its' flavor and nutritional value. Consumers will be allowed to purchase these pineapples right off of the farm.

Activities Performed:

1. Pineapple slips were issued, planted and approximately 50% were harvested prior to end of grant period

2. Irrigation equipment was issued to sub-grantee.
3. Other planting materials were supplied by the sub-grantee.
4. 600 pineapple plants were planted

Problems and Delays: The Virgin Islands experienced a heavy rain season which affected the planting of the pineapples as well as growth and maturity.

Project Title: Developing Year-Round Mango Production through Improved Management.
Individual Name: Kirk Benoit

The purpose of this project is to establish a two acre demonstration mango orchard to educate small orchard farmers on the benefits of scheduled tip pruning of mango trees in order to develop year round production systems.

Activities Performed:

1. 150 Fruit trees were issued, planted and harvested.
2. Irrigation and other planting materials were supplied by sub-grantee.

Problems and Delays: None

Project Title: Expanding Locally Grown Pineapple Production.
Individual Name: Yvette Browne

The purpose of this project is to create a model for the potential of growing pineapple on a larger scale. The project will demonstrate the potential economic impact of such a production on a large scale done for commercial purposes. The model project will allow for others to see the challenges and benefits of planting orchards in this region and also allow for tours and learning experiences. This farm does offer farm tours and will encourage varying schools to preview the model fruit plot.

Activities Performed:

1. Pineapple slips were issued and planted.
2. Irrigation equipment issued to sub-grantee
3. 600 pineapple plants were planted.
4. Farm tours were available to the public throughout the program

Problems and Delays: Rain damaged and stunted some growth, however more than 75% matured

Project Title: Diversification of Specialty Lettuce Production.
Individual Name: Brian McCoulough, Tropics Hydroponics Farm, LLC.

Activities Performed:
Tropics Hydroponics Farm LLC has invested considerable resources in the creation of our lettuce and tomato production facility which is the only hydroponics farm in the U.S. Virgin Islands. The goal of this proposal is to demonstrate lettuce and tomato production by testing two new varieties of lettuce and one additional tomato variety. We intend to demonstrate that with the use of the right equipment and techniques, leafy greens and tomatoes can be produced successfully, year-round here in the U.S. Virgin Islands, using only a fraction of the water and land area that traditional farming would require.

Problems and Delays: This project was unable to begin due to delays with VIDA project management and the acquisition of the Grant Manager. This recipient withdrew application. The recipient will reapply for funding for future projects.

Project Title: Greenridge Guavaberry Farm.

Individual Name: Myron Henneman.

Activities Performed:
Myron Henneman, the owner of Greenridge Gauvaberry Farm, has been working in conjunction with small markets and restaurants to plant and cultivate specialty produce for sale and consumption. This model project may act as a demonstration to beginning farmers as well as display the ability to increase domestic production of a variety of specialty crops demanded by local markets, restaurants and consumers.

Problems and Delays: This project commenced in July of 2011. Plants were planted and were maturing by end of project program.

Project Title: Growing Leafy Green Asian Vegetables.
Individual Name: June Archibald, *Precious Produce Farms* (PPF).

Activities Performed:

The lack of a variety of fresh leafy green Asian vegetables in the U.S. Virgin Islands presents an opportunity to demonstrate specialty greens production and niche marketing to chefs, specialty supermarkets, and consumers. While most local customers and chefs are familiar with bok choy, there are a wide variety of Asian greens that are heat-tolerant and therefore can be grown in the territory year-round. These greens can also be easily incorporated into local menus to create tasty salads, soups and entrees. PPF has had success with growing and supplying chefs with some of the lesser known varieties (mizuna, mibuna, yu choy) over the past three years.

PPF will grow leafy green Asian vegetables to produce micro greens for use in salads as well as more mature greens to be used in soups and entrees. For example, baby mizuna may be mixed with baby komatsuna and mini yu choy to create a distinctive salad when added to locally available lettuces and herbs. Likewise, more mature versions of the same leafy Asian vegetables can be stir fried with locally grown ingredients, such as

seasoning peppers, green onions and thyme for a side dish or sauteed and simmered with meats, fish or other seafood to create delicious soups and succulent entrees. The same leafy vegetables may also be combined with locally grown root vegetables for a delectable vegetarian culinary experience. Demonstrations of how the leafy green Asian vegetables may be used in menus will be developed by PPF for special events to be attended by chefs, nutritionists, cooks and local consumers.

Problems and Delays: This project was delayed due to VIDA project management, however recipient was reviewed and visited by Grant Manager – Abbelle Bakr in July 2011, and was issued funds for composter in amount of $2,000.00.

Project Title: Feeding St. John, an East End Solution.
Individual Name: Thalia Reyes

Activities Performed:

The main objective of this Specialty Crop Block Grant- Farm Bill 2009 application is to establish a fruit orchard demonstration model on the East End of St. John. The demonstration model would be available for viewing by school classes, farmers and other interested parties to benefit from an education on orchard establishment. I envision a project that would benefit St. John by eventually providing healthy and nutritious food to the population, raising awareness of the importance of sustainability, reducing the need for imported products, and guaranteeing a fresher product for consumers. The demonstration model will consist of the following actions:

1. Identify a 1 acre parcel on our property near well for planting the orchard.

2. Clear proposed area by hand, set aside removed rocks for use in the future, and prepare it for planting..
3. Fence the marked area to protect against goats, donkeys and soldier crabs.
4. Prepare water irrigation tubing and those items associated with irrigation.
5. Plant 100 fruit trees including citrus, mango, and avocado.
6. Use the established orchard to encourage other landowners on St. John to plant fruit tree orchards.
7. Apply proper quality control measures to ensure that the product is marketable for consumption.

Problems and Delays: Despite delays this project was fully funded and recipient was able to construct proper water catchments and irrigation in order to properly care for the new crops. The crops were planted and maturing by end of project.

Project Title: Fruit Orchards Intercropped With 4-Year Rotation of Vegetables H3 Farms**.**
Individual Name: Tiffany Moorhead.

Activities Performed: None

This sub-grantee was deployed overseas with the National Guard after her proposal was accepted. This deployment has prevented her participation in the project to date. No materials were issued to her. The recipient withdrew from project making funding available for another sub grantee.

Project Title: Developing a System for Small Scale Manufacturing of Beekeeping Products.
Individual Name: Monica Altamirano.
Location: St. John (see map).

Activities Performed: None

Problems or Delays: This sub-grantee suffered major losses during Hurricane Earl that caused her to withdraw from participating in the project.

Project Title: Expansion of Pineapple Orchard
Individual Name: Nevon DeCastro

This sub-grantee was awarded during the second request for proposal issued for this grant in June of 2011. The second requests were issued due to the availability of funding that came from previous withdraws from the program. This sub-grantees application went through the same RFP and selection process as previous awardees and in addition this project was shovel ready and could be completed by end of grant program.

Activities Performed:

The sub grantees area was terraced in order to establish orchard on a hilly plain. The sub grantee was reimbursed for pineapple plants slips and irrigation work done to the property. The sub grantee planted 500 pineapple slips that began maturing by the end of the grant period.

Problems or Delays: None

Project Title: Guava Orchard
Individual Name: Charles Barry

This sub-grantee was awarded during the second request for proposal issued for this grant in July of 2011. The second request was issued due to the availability of funding that came from previous withdraws from the program.

This project created a Guava Orchard that provides a sustainable supply of guavas for private and commercial customers. The project made available this specialty crop which is not easily available in some areas at an affordable cost. The project also created a teaching / learning environment to inner city youth (young men particularly) in the Savan Area.

Activities Performed:

1. Cleared 200*200 sq. ft. area for planting
2. Prepared the land using manure and other mixes
3. Provided Drip Irrigation
4. Planted 100 guava slips

Problems and Delays: None

Project Title: Increasing Child and Adult Nutrition Knowledge and Consumption of Specialty Crops
Individual Name: Jacob Spell

This project was funded during the second round of RFP's. The primary goal of the project is the development a sustainable Agri-business model in limited water resource region. In doing so, the project increased knowledge to local farmers in that area as well as increase knowledge to the general public of the nutritional value of eating specialty crops.

Activities Performed:

1. Clear 5.05 acre property
2. Lay Ground Cover
3. Place drip irrigation and construct water catchments for rain water

There were 1000 pineapple plants planted by the end of the project. This farmer has plans for other specialty crops to include: papaya and some leafy greens

Problems and Delays: None

In support of these above stated activities the Virgin Island Department of Agriculture launched its' marketing campaign entitled: Buy Local, Eat Fresh, Always Eat Virgin Fresh.

- The "Virgin Fresh™ - Buy Local, Eat Fresh" marketing campaign was launched to promote the local specialty crop industry through print/radio/online/TV ads, stickers, signage, etc. Promotional material were prominently posted and distributed at farmers markets, grocery stores, and other outlets where the products are now being sold. The marketing campaign will consisted of hiring an advertising company to develop print, online and radio ads to promote the specialty crop projects. This campaign airs on all three islands with the goal of increasing child and adult nutrition knowledge and consumption of specialty crops.

- Farm tours have been organized by the VIDA for various farms who participated in the program. The primary targets for these farm tours were: interested farmers, school children, and other visitors who are interested in learning more about local specialty crop production. Many local elementary schools have since participated and have been encouraged to develop school gardens.

- Leafy greens harvested from the demonstration plots were marketed to restaurants and retail buyers.

- The "Virgin Fresh™ - Grow Local, Buy Local" marketing campaign will continue with production of various episodes of the VIDA's "Fresh from the Farm" TV show. The show will focus on the fruit orchards

and leafy greens projects to allow home viewers the opportunity to see how the project unfolds on each island. These episodes can also serve as a teaching tool for future producers, consumers, students and the general public.

BRANDING

The Virgin Fresh logo developed during the VIDA's Federal State marketing Improvement Grant from the USDA AMS was tweaked to specifically represent the specialty crop industry and encourage buyers to purchase locally grown specialty crops. This logo will be used in all marketing material for the project as well as on any packaging for the specialty crops produced during the project.

Goals and Outcomes Achieved

1. The establishment of ten (10) new one to five acre specialty crop demonstration plots in the territory with 100 plus trees per orchard.

2. The establishment of three (3) new 0.25 to 0.5 acre demonstration models in the territory that demonstrate leafy green production.

3. Twenty (20) local farmers were educated about the SCBG-FB grant and how applying for and participating as a sub-grantee can advance the U.S.V.I. specialty crop industry via a training session facilitated by the Department of Agriculture

4. Three (3) new orchards were established in the territory due to the models and encouragement of the program.

5. Two (2) new leafy green production enterprises were established in the territory since the beginning of the project.

6. VIDA purchased rototillers to properly prepare and cultivate small acreages especially in hilly/terraced terrains in St. Thomas. These rototillers will be held by the VIDA and used at the demonstration plots as needed. These rototillers were used to establish two (2) new pineapple orchards encouraged by this project.

7. Funding for a composter was issued to interested sub-grantee in model project to demonstrate reuse of on-farm organic matter to create a source of organic matter for inputs into the farm.

9. Increase awareness of the burgeoning specialty crop industry amongst consumers, restaurateurs and supermarket owners.

Beneficiaries

The beneficiaries of this project included the farmers (10 sub-grantees) who applied and were awarded funds to expand or establish model farms. This exercise encouraged proper data collection and implementation of best practices as these beneficiaries represent the models for others to follow. Two (2) Elementary Schools - Agriculture programs participated in farm tours. These schools also used these models for their own community garden projects. Approximately twenty (20) pineapple slips were donated to school gardens. In addition, the community at large benefited from these models, garnered knowledge of the production and nutritional benefits of specialty crops as well as making specialty crops more available to the community. The results of this project will be seen in the Territory for years to come.

Lessons Learned

The Model Project brought to light the challenges and triumphs that can be expected in both the administration of such a project as well as the ability to plant and harvest the specified specialty crops in the Territory of the Virgin Islands. It was necessary during this project to bring in additional human resources ie. Grant manager to assist in monitoring, supporting and reporting on sub grantees activities.

The project also brought to light the need for continued research of the conditions of our farming areas. The lack of soil testing and available water supply as well as pest control issues can create challenges relative to harvesting quality crops and so, these areas need to be continually researched and addressed. The use of rototillers and construction of terraces were conducive to planting specialty crops in hilly areas. Animals roam free in many of these areas and are hazardous to specialty crops and so, proper fencing is essential for successful farming.

The local farmers and community on a whole were very receptive to the information and products that came out of this effort.

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